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wherein M is Fe[II], Fe[III], ~~Ni[II]~~, Co[I], Co[II], Co[III], V[III], Mn[I], Mn[II], Mn[III], Mn[IV], Ru[II], Ru[III] or Ru[IV]; Pd[II], ~~V[III]~~, V[IV] or V[V].

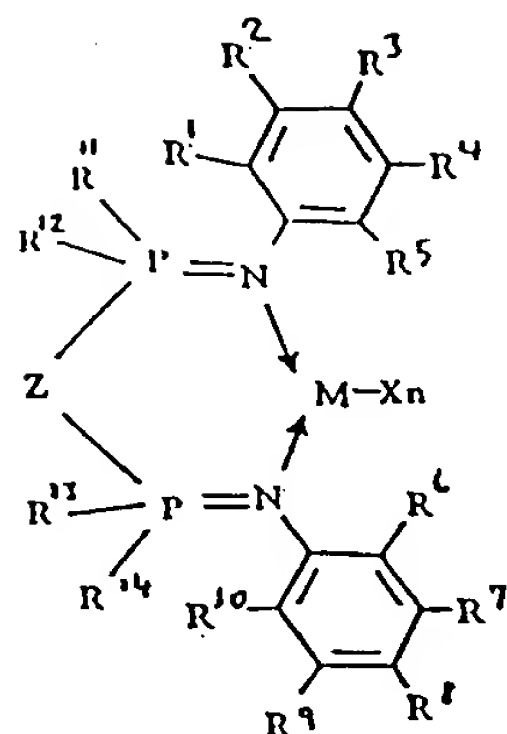
X represents an atom or group covalently or ionically bonded to the transition metal M;

15 R is independently selected from hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl or substituted heterohydrocarbyl;

Z is a bridging group comprising a donor atom of N, P or S or alternatively is a neutral group comprising a C₁-C₄ alkylene group, a silyl or germyl group, and

n = an integer to satisfy the valency of M.

20 2. A transition metal complex having the formula:



wherein M is Fe[II], Fe[III], Ni[II], Co[I], Co[II], Co[III], V[III], Mn[I], Mn[II], Mn[III], Mn[IV], Ru[II], Ru[III], or Ru[IV]; Pd[II], V[III], V[IV] or V[V].

X represents an atom or group covalently or ionically bonded to the transition metal M;
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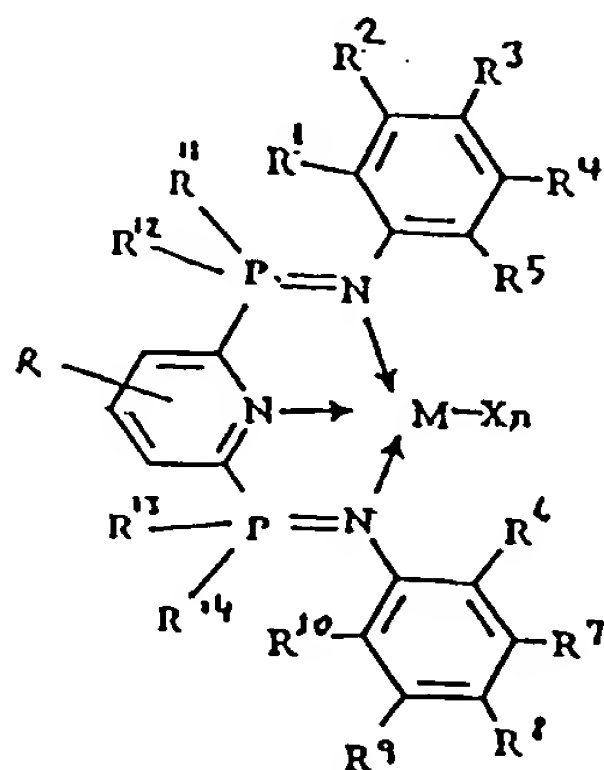
R¹ - R¹⁴ are independently selected from hydrogen, halogen, hydrocarbyl, substituted hydrocarbyl, heterohydrocarbyl, or substituted heterohydrocarbyl, and
n = an integer to satisfy the valency of M.

3. A complex according to claim 2 wherein at least one of R¹ - R¹⁰ contains two or more carbon atoms.

4. A complex according to claim 2 wherein R¹¹ - R¹⁴ are phenyl, alkyl or cycloalkyl.

5. A complex according to any of the preceding claims wherein the bridging group Z is -CH₂- or a donor atom N.

6. A complex according to any of the preceding claims having the formula



wherein M, X and R¹ - R¹⁴ and n are as claimed in claim 2, and R is hydrogen or hydrocarbyl.

7. A complex according to any of the preceding claims wherein the metal M is Fe, Ni or Co.

8. A complex according to any of the preceding claims wherein the group X is chloride.

5 9. A polymerisation catalyst comprising

(1) a transition metal complex as defined in any preceding claim, and

(2) an activating quantity of an activator compound.

10. A catalyst according to claim 9 wherein the activator compound is an organoaluminium compound or a hydrocarbylboron compound.

10 11. A catalyst according to claim 9 further comprising a neutral Lewis base.

12. A catalyst according to any of claims 9 to 11 further comprising a support.

13. A catalyst according to claim 12 wherein the support is silica, alumina, or zirconia or is a polymer or prepolymer.

14. A catalyst according to any of claims 9 to 13 further comprising a catalyst suitable for the polymerisation of olefins of the type used in conventional Ziegler-Natta catalyst systems, metallocene-based catalysts, monocyclopentadienyl- or constrained geometry based catalysts, or heat activated supported chromium oxide catalysts (eg Phillips-type catalyst).

15. A process for the polymerisation or copolymerisation of olefins comprising contacting a monomeric olefin under polymerisation conditions with a complex or catalyst as defined in any preceding claim.

16. A process according to claim 15 wherein the polymerisation conditions are solution phase, slurry phase or gas phase.

17. A process according to claim 16 wherein the polymerisation is conducted under gas phase fluidised bed conditions.

25 18. A process according to claim 17 wherein the polymerisation is conducted under condensed mode.

19. A process according to any of claims 14-18 wherein hydrogen is used to control the average molecular weight of the polymer.

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